From: Tzhone, Stephen
To: Rauscher, Jon; Khoury, Ghassan
Cc: Sanchez, Carlos; Meyer, John; Villarreal, Chris
Subject: RE: Draft discussion of principal threat waste at the Arkwood AR site
Date: Wednesday, June 03, 2015 1:09:00 PM

See below on info concerning using risk vs hazard quotient.

Let me know any final comments. I have to summarize our position on Arkwood and send back to OSRTI.

From: Berg, Marlene
Sent: Wednesday, June 03, 2015 12:02 PM
To: Tzhone, Stephen
Cc: Poore, Christine
Subject: RE: Draft discussion of principal threat waste at the Arkwood AR site

Steve,
Here are responses to questions posed by Ghassan.

We are identifying principal threat waste based on risk, rather than a hazard quotient, because of regulatory language for principal threats. Specifically, the NCP states:

> EPA expects that treatment will be the preferred means by which to address the principal threats posed by a site, wherever practicable. Principal threats are characterized as waste that cannot be reliably controlled in place, such as liquids, highly mobile materials (e.g., solvents), and high concentrations of toxic compounds (e.g., several orders of magnitude above levels that allow for unrestricted use and unlimited exposure). (See 55 FR 8703, March 9, 1990)

The NCP does not provide language for non-cancer effects.

A risk level of 10-3 is being used to show that soil contaminated with dioxin under the cover is not considered a principal threat waste. This risk level is taken from the November 1991 *A Guide to Principal Threat and Low Level Threat Wastes:*

> Principal threat waste are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. They include liquid and other highly mobile materials (e.g., solvents) or materials having high concentrations of toxic compounds. No “threshold level” of toxicity/risk has been established to equate to “principal threat”. However where toxicity and mobility of source material combine to pose a potential risk of 10-3 or greater, generally treatment alternatives should be evaluated.

Lastly, the conclusion that soil under the cover does not exceed a risk of 10-3 is based on the RSL of 22 ppt TEQ for industrial soil. While a Tier 1 IRIS value does is not available at this time for a CSF for TCDD, Tier 3 CSFs for TCDD are available; the RSL of 22 ppt TEQ is based on the CAL EPA CSF for TCDD, which is considered a Tier 3 toxicity value. (Information on the 2003 OSWER memo on

toxicity hierarchy can be found at: http://www.epa.gov/oswer/riskassessment/pdf/hhmemo.pdf)

Marlene

From: Tzhone, Stephen
Sent: Tuesday, June 02, 2015 5:36 PM
To: Khoury, Ghassan; Sanchez, Carlos; Rauscher, Jon
Cc: Villarreal, Chris
Subject: RE: Draft discussion of principal threat waste at the Arkwood AR site

Let me reconnect with Marlene on this.

From what I'm understanding:

1) Marlene is stating "A cancer cleanup level at 1 x 10-6, based on default exposure factors, would be 22 ppt TEQ" per this reference: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/ Then, she is just moving the decimal to reflect 22,000 ppt TEQ for 1 x 10-3, which can be a threshold for principal threat waste since it is outside the risk range. Thus, since 22,000 ppt is higher than what we have under the cover (i.e. 16,750 ppt) we would have no principal threat waste.

2) Ghassan is stating the hazard quotient should be used instead since "we still do not have a good value or IRIS value for cancer effects" from that reference. Thus, since 16,750 ppt would equal about HQ=23, the question would be if that was above or below the 'unknown' HQ threshold for principal threat waste.

From: Khoury, Ghassan
Sent: Tuesday, June 02, 2015 5:08 PM
To: Sanchez, Carlos; Tzhone, Stephen; Rauscher, Jon
Cc: Villarreal, Chris
Subject: RE: Draft discussion of principal threat waste at the Arkwood AR site

The maximum dioxin TEQ level under the cover is 16,750 ppt. The noncancer hazard or hazard quotient associated with 16,750 ppt is about 23 assuming default values for an industrial worker. This is much higher than the EPA acceptable HQ of 1. Marlene in her statement used the cancer effect of 1×10^{-3} as the basis for Principal Threat waste as reported in the 1991 document. However, for dioxin, we still do not have a good value or IRIS value for cancer effects. The toxicity value for dioxin is based on reduced sperm count in men exposed to dioxin as boys. The study is based on human cohort study with a high confidence in the study. The question is whether a HQ of 23 would categorize a waste as a Principal Threat waste or not.